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Notes on American Ferns—XVI.¹

WILLIAM R. MAXON.

SELAGINELLA HUMIFUSA Van Eseltine. This name, recently given by Van Eseltine² to a species of central and southern Florida allied to *S. arenicola* Underw., is, unfortunately, invalidated by *S. humifusa* Hieron., applied several years earlier to a plant from Borneo.³ The Florida species may therefore be known as **Selaginella floridana** Maxon, the type being *Nash* 1449, from the vicinity of Eustis, Lake County, July 16-31, 1894. *Selaginella floridana* is known otherwise from specimens collected near Sanford, Orange County, in September, 1902, by S. Rapp, and in the vicinity of Alapattah, Dade County, by A. A. Eaton.

LYCOPodium obscurum L. This species, as *L. dendroideum* Michx., was reported from Sand Mountain, in Jackson and De Kalb counties, Alabama, by Mr. Graves in the JOURNAL for July-Sept., 1920, upon specimens collected by himself. An earlier Alabama collection, apparently never reported, is of material in the Mohr Herbarium (in the National Herbarium) collected in boggy open situations 7 miles from Mentone, De Kalb County, October 13, 1900, by Miss Inez Loring. The specimens were presumably received by Dr. Mohr too late to permit listing this species in the Plant Life of Alabama.

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²Contr. U. S. Nat. Herb. 20: 165. pl. 18. text fig. 65. 1918.

³Hedwigia 51: 257. 1911.

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LYCOPODIUM SITCHENSE Rupr. According to material in the National Herbarium, the range of this species must be altered to read: Alaska to southeastern Labrador and western Newfoundland, south to Oregon, Idaho, the northern shore of Lake Superior, northern New York (Adirondack Mountains), New Hampshire (Mount Washington), and Maine (several localities, including Mount Katahdin). The western range has long been known to include Washington, numerous specimens being at hand from the region of Mount Rainier, Stevens Pass, Mount Paddo (Adams), and the Olympic Mountains, at altitudes of 1,200 to 2,100 meters. The Oregon record, which appears to be new, rests on a single specimen from the shore of Amabilis Lake, Calapoaia Mountains, August 9, 1897, *Coville & Applegate* 496. The Labrador record is authenticated by a specimen collected at St. Michaels, in August, 1891, by Waghorne (no. 7a). In British Columbia, Washington, and Oregon, *L. sitchense* is found almost exclusively in wet mountain meadows, while in the east it occurs in various habitats, reaching its best development in upland spruce woods and thickets.

LYCOPODIUM ANNOTINUM L. This species is known from northeastern Washington (*Kreager* 412) and the region of Mount Rainier (*Piper* 2110, *Flett* 2014), but is not mentioned by recent writers as occurring in Oregon. There is at hand, however, an excellent specimen collected at the base of Mount Hood, Oregon, in October, 1884, by Thomas Howell, properly determined and labeled in his hand. It belongs to the typical form of the species.

In the eastern United States, Pennsylvania is commonly given as the southern limit of this species. It was collected in the mountains of Garrett County, in extreme western Maryland, as long ago as 1875, however,

by Capt. John Donnell Smith, as shown by two specimens in the National Herbarium.

PTERETIS NODULOSA (Michx.) Nieuwland. An unidentified specimen of this species was included in a collection of plants from the Queen Charlotte Islands recently sent to Prof. C. V. Piper, of the U. S. Department of Agriculture, for examination. The label indicates that it was collected at Skidegate, by C. F. Newcombe, in August, the year uncertain. *P. nodulosa* is usually attributed to British Columbia, but it is evidently rare in that region, and it seems worth while to publish a record of this specimen, a portion of which has been added to the National Herbarium. Since this species is not known to occur in Alaska, the present specimen appears to represent the northwestern limit of its range.

PELLAEA LONGIMUCRONATA Hook. Additional Colorado specimens of this species are at hand from Mr. John P. Young, who collected them at Canyon City, August 12, 1919. The only other Colorado material known to the writer is that collected at the same locality by Brandegee nearly fifty years ago, a specimen of this collection being in the D. C. Eaton Herbarium.

DRYOPTERIS ARGUTA (Kaulf.) Watt. This plant of the Pacific coast region, which has usually been known as *Dryopteris rigida arguta* (Kaulf.) Underw., differs widely from the European *D. rigida* and is very clearly entitled to the specific rank reaccorded it by Watt in 1866.¹ It is, however, frequently confused with *D. filix-mas*, not only by collectors but in the herbarium as well. The firm, strongly convex indusium of *D. arguta*, with its deep, narrow sinus and glandulose margins, has commonly been regarded as a distinguishing character, the indusia of *D. filix-mas* ordinarily being thin, orbicular-reniform, and glabrous; but the marginal

¹Canad. Nat. II. 3: 159. 1866.

glands are not always easily seen in mature specimens of *D. arguta*, and plants of *D. filix-mas* growing in exposed situations often show firm indusia very similar to those of its near ally. Distinctive differences are, however, found in the foliage characters, which may be stated briefly as follows:

Pinnae sessile, oblong-lanceolate, the lower basal pinnule usually with a semicordate base, this overlying the primary rachis; veinlets spreading, all ending in salient spinelike teeth.

D. arguta.

Pinnae mostly short-stalked, deltoid-lanceolate, the basal pinnules symmetrical, distinctly apart from the primary rachis; veinlets oblique, fewer, ending in oblique, usually curved teeth, these merely acute. *D. filix-mas.*

Dryopteris arguta is a very common species of rocky ravines and partially shaded slopes in southern California, whence it extends northward (chiefly in the coastal and interior valley regions) to western Oregon and the bluffs of the Columbia River above Cathlamet, Washington, in the Upper Sonoran and Transition zones. Its reputed occurrence in British Columbia is extremely doubtful. *Dryopteris filix-mas* extends from Newfoundland to British Columbia, south to Vermont, South Dakota, extreme western Oklahoma, New Mexico, Arizona, Nevada, and Oregon, being restricted apparently to the Canadian and Hudsonian zones. It occurs also at a single locality in California,—Holcomb Valley, San Bernardino Mountains, altitude 2,400 meters, August 3, 1882, S. B. & W. F. Parish 1613,—as reported long ago by Mr. S. B. Parish. A specimen of this collection is in the Dudley Herbarium of Stanford University.

WASHINGTON, D.C.

The Soil Reactions of the Ferns of Woods and Swamps.

EDGAR T. WHERRY

The ferns to which this essay is devoted are on the whole less sensitive to soil acidity and alkalinity than those which grow on rocks, to which attention was directed in a previous paper.¹ It seems worth while, however, to place on record what data have been obtained on testing the soils surrounding their roots by the indicator method. The introductory and explanatory portions of the paper cited apply sufficiently well to the present one to make their repetition unnecessary. The data are presented in similar form, although a slightly different method of classification seems desirable, for additional types of reaction-range are represented. The following designations are used in the class column of table 1:

AA, intensely acid; appearing to thrive only in medi-acid soils.

A, acid; growing well in soils of practically all degrees of acidity.

I, indifferent (relatively); appearing to thrive in both acid and alkaline soils, so long as neither reaction is extreme.

C, calcareous or circumneutral; growing best in neutral soils, though extending throughout what is termed the circumneutral range (specific acidity 10 to alk. 10). No instance has been found of a species which will not grow in neutral or slightly acid soils as well as in actually alkaline ones.

In the last column the geographic range is described by S for southern, N for northern, and a dash,—, when the species is wide-ranging.

¹Amer. Fern Journ., 10: 15-22, 45-52, 1920.